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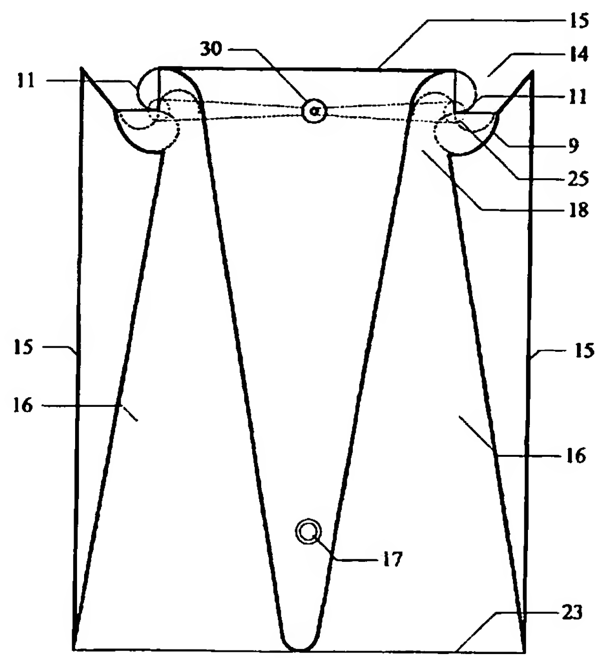
(54) Titre : DISPOSITIF EMPILABLE D'AEROTURBINES JUMELLES
(54) Title: WIND DRIVEN TWIN TURBINES STACKABLE DEVICE




(57) Abrégé/Abstract:
This invention relates to vertical and horizontal axle wind turbines. In particular, to a device that takes in all the wind cross section facing it, and with minimum loss on frictional and mechanical resistance, puts it to work to spin a generator, for instance. It's superiority is revealed in it's ability to increase wind energy by increasing air density in wind compaction tunnels, then gradually releasing that into smaller wind turbines which can work separately, in pairs, and groups, on one or more generator, and can be stacked in an airtight fashion. Thus the device can produce at wind velocities from the very low to the structural damaging. The invention is customer innovation driven with a universal, industrial, commercial and retail application.

## Abstract

This invention relates to vertical and horizontal axle wind turbines. In particular, to a device that takes in all the wind cross section facing it, and with minimum loss on frictional and mechanical resistance, puts it to work to spin a generator, for instance. It's superiority is revealed in it's ability to increase wind energy by increasing air density in wind compaction tunnels, then gradually releasing that into smaller wind turbines which can work separately, in pairs, and groups, on one or more generator, and can be stacked in an airtight fashion. Thus the device can produce at wind velocities from the very low to the structural damaging. The invention is customer innovation driven with a universal, industrial, commercial and retail application.

The present invention relates to wind turbines. In particular to a device that increases wind potential energy by compacting then gradually releasing it from upwind compaction tunnels into downwind expansion blades of wind driven twin turbines to rotate their axles, which in turn rotate electric generators or such similar device.

Presently known arts do utilize wind energy to do such work as generating electricity. In doing so, inventors took any of two directions or the combination, thereof. One direction, influenced by the early aeronautic period, used airfoils: vanes, blades, and propellers to rotate an axle in an aerodynamic fashion. The other direction used the wind push to turn turbine blades placed in its path. The former split the defuse wind energy vector into three components, using one only. As a result, efficiency ranged from: 6% to 31% - 'Power From The Wind' - P. C. Putnam, 1948. Inefficiency led to huge designs to boost productivity. The result was: higher cost per kilowatt, long idling time, narrower spans of useful wind velocity, and a safety hazard. Even though the wind push method used the entire wind energy vector cross section, turbine designs still used up a huge portion of it just to overcome resistance. Known arts did not yet invent means of reducing turbine size effectively. In both cases it is noticed that devices marketed today work only as separate units, with a substantial portion of the wind vector cross section passing unused through and around them. In both directions taken by inventors, weight and cost are still high, while productivity is marginal at best.

A device is needed which can reduce the size of the moving parts and therefore the idling time and cost. One that can compact the defuse wind energy vector cross section, lower it's start-up limits and increase productivity, while allowing the use of the full wind velocity vector cross section per unit of surface, specially when laterally and vertically

stacked. This invention is attempting to do just that.

A short patent search revealed a number of related arts. The nearest to this invention was considered: CP # 012128167 = USP # 5,332,354 of Mr. John Lamont of Winnipeg, Manitoba, Canada. Firstly: in trying to combine both the aerodynamic and the wind push methods, Mr. Lamont created conditions for turbulence in a number of places, which he eliminated by wind volume flow control which lowered productivity. Secondly: his device's area of effective wind vector cross section is less than that of the device especially when the secondary housing is in place. Thirdly: perfect stacking is difficult. Fourthly: high productivity is only possible with huge designs that need higher start up wind velocities which are a factor that limits the use of Mr. Lamont's design both spatially and temporally.

The present invention is a rectangular twin turbines stackable device that overcomes the mentioned problems and disadvantages. It includes preferably, a pair of side-by-side compaction tunnels, placed lengthwise parallel to the wind direction. These are equal in length and many times longer than their wind entrances total width or height. The upwind side width wall of the device's rectangular housing is removed and replaced by two wind compaction tunnels entrances which totally and equally occupy it's space. The long walls of the compaction tunnels taper off into exits that are each many times smaller than any of the two wind compaction tunnels entrances. While the wind compaction tunnels entrances are air tightly connected by means, to one another and to the wind compaction tunnels, the tunnels exits downwind, are also each air tightly connected by means, each to a wind turbine housing positioned tangentially and downwind, such that the wind turbines axes of rotation lie in the extension plan of the wind compaction tunnels long axes either horizontally or vertically. Axially positioned, in the turbine housings, the two turb

-ine axles are either vertical and closer to one another; or in one aspect of the invention, closer to the neighboring long walls of the rectangular devices housing. And when horizontally built, they are either near the device roof or it's floor. In case of vertical axle designs, one turbine is always elevated above the other to allow for placement of one or more generator or machine.

To each axle of the two turbines there are, attached at one edge, by means, four hemispherical or half cylindrical expansion blades positioned 90 degrees one behind the other. The blades concave faces face upwind, while the edges of each blade, not contacting the axle, are snuggishly fitting the inner contours of the turbine housing. By introducing compressed air into an expansion blade concavity through the compression tunnel exit it rotates the turbine axle a quarter revolution, and for the next quarter revolution this blade deflates through a rear exhaust in the turbine-housing wall. The rotation of both turbine axles is transferred, by means, to one or more rotor when both are spinning in the same direction, and to rotate a rotor and a stator in a unique generator, when spinning in opposite directions. In the latter case the device is made to produce at very light wind velocities with minimum idling time. The unique generator is one where both magnet and coil rotate opposite one another.

Where wind is unidirectional, one aspect of the invention may take the shape of a long rectangular building, stretched parallel to the wind vector, with the upwind short side wall moved back to near, the rear wall forming a huge compaction tunnel upwind, and a rear turbines room downwind. Downwind, exits through the moved wall are air tightly connected, by means, to turbine housings.

In drawings which illustrate exemplary embodiments of the present invention:

Figure 1 is a front view of two wind driven twin turbine devices, vertically stacked.

Figure 2 is a plan view along section A A' of figure 1.

Figure 3 is a rear view of figure 1 with the rear wall removed showing the main components in the turbines rooms of both devices.

Figure 4 is a side view of figure 1 along section B B' with the main components in the turbines rooms visible.

Figure 5 is a schematic showing five possible turbine-to-generator coupling arrangements. Arrows show stacking directions.

Figure 6 is a plan sectional view as in figure 2 of another aspect of the present invention.

Referring to the drawings, particularly to figures 1 to 5, there is illustrated a vertical stacking of two wind driven twin turbine devices in identical, elongated, rectangular device housings 15 which can be made of light metallic and composite building materials. Each illustrated device comprises a device housing 15 with the short upwind side wall removed and replaced by two equal-sized wind entrances 23 that occupy the whole area of the side. Stretched horizontally downwind and air tightly connected, by means, to each wind entrance 23 are wind compression tunnels 16 having flat smooth walls 24 tapering off gradually into wind compression tunnel exits 18 each. The wind compression tunnel exits 18 are each many folds smaller than the corresponding wind entrance 23, and slightly elevated one relative the other, to facilitate the positioning of generators 30.

Exits 18 of the wind compression tunnels 16 are each air tightly connected, by means, to a wind turbine housing 9, placed tangentially and downwind from the corresponding wind compression tunnel 16 with the long axis of that wind compression tunnel passing at right angles to the wind turbine housing axis of rotation. The wind turbine housing 9

may be cylindrical or discoid in shape, and positioned vertically or horizontally, and may be nearest or furthest from the device's long axis plan running between the two-wind compression tunnels 16.

Each wind turbine housing 9 has an air exhaust outlet 14 located a quarter revolution downwind from the corresponding wind compression tunnel exit 18 on the circumference of the wind turbine housing 9. The area of the air exhaust outlet 14 is the distance of the wind turbine housing quarter circumference times it's height taken parallel to it's long axis. The wind turbine housing 9 air exhaust outlet 14 penetrates through the device housing 15 rear short wall to the atmosphere.

Wind turbine axles 26, axially placed and freely rotating, by means, in the wind turbine housings 9, extend beyond the wind turbines housings limits, and are supported, by means, at one extremity, allowing their free spinning, while at the other extremity they end in flywheels 25 that facilitate coupling with generators 30 or any other useful appliance. To the portion of each of the axles 26 inside the wind turbine housings 9, are fitted firmly and air tightly, by means, four wind expansion blades 11, positioned 90 degree, one behind the other, and the concave faces always against the wind flow and three blade edges snuggishly touching the inner walls of the wind turbine housing 9 but freely rotating in it.

The device's housing 15 is held up in position by self-orienting support means comprising:

a pivoting means 17 medially placed upwind, a little distance behind and between the wind entrances 23 of the upwind end of the wind compression tunnels 16; and

pairs of rolling means 19 firmly connected to the underside of the device's housing 15 and positioned laterally near the short back wall of the device housing 15.

The pivoting means 17 is firmly imbedded in the circular platform 10 and penetrates the roof of the device's housing 15, while the rolling means 19 freely move on top of platform 10.

The device may take the aspect of figure 6 when sufficiently strong, unidirectional wind prevails. Then the two wind compaction tunnels 16 are replaced by one compaction compartment occupying most of the device's housing 15 on the upwind side, with the short wall facing the wind removed backward to near the back wall to form downwind turbines room. In this aspect of the invention the compaction compartment exits 18 are located in the inner wall itself and are air tightly connected downwind, by means, to wind turbine housings 9.

The wind driven twin turbines device operates both individually and in groups, thus maximizing productivity beyond the scope of any device yet available.

The wind entrances 23, occupying all the wind-facing area of the upwind short side wall of the device housing 15 insure the maximum use of the defuse wind energy vector cross section, without energy loss - through bypassing, in or around the device.

The upwind portion of the device, in all aspects, concentrates the defuse wind energy vector cross section in two ways: by gradually reducing it to the cross section of the wind compaction compartment or tunnels 16's exits 18, and so raising it's potential energy; and also by compressing it at the exits 18 under the force of the wind mass in the wind compaction tunnels as acted upon by the wind velocity vector cross section at the wind entrances 23. As such: the bigger the wind velocity and the dimension of entrances 23, relative to the exits 18, longer the wind compression tunnels 16, and the smoother it's inner walls; the greaters the potential energy at exits 18.

The reduced wind turbine dimensions increase efficiency in two ways: by reducing weight therefore cost, and by reducing dimensions and weight, therefore reducing frictional and mechanical resistances necessary to overcome before any production begins. The result expected is less idling time and wider temporal and spatial use.

The present invention designs ability to move one generator with one or more turbines as in figure 5 ( a, d, e ) allows the device to commence production at very low wind velocities. On the other hand it's ability to move one or more generators with one turbine as in figure 6 ( b and c), increases the span of it's use, under conditions of high wind velocities, to near the structural limits. These can easily be predicted for any location from meteorological data and wind rose technique. In short, the present invention can be tailored to work efficiently in wind velocities barely exceeding the frictional and mechanical resistance, to wind velocities of hurricane magnitude.

The box shape of the device housing permits stacking while the large roof area is ideal for solar panels in calm sunny days.

Environmental and safety issues are well served by the invention's production of clean sustainable energy and the small concealed moving parts.

Electric energy production, in this invention, is believed to be big enough to serve the needs of the widest spectrum of consumers. Futuristic usage includes: powering and recharging stations for electric vehicles; designer water; hydrogen and oxygen production; elimination of sewage water recycling and dumping in rivers, lakes, oceans, and it's use in farming; also ozone layer replenishment; and restoring of atmospheric oxygen lost to internal combustion engines and to the stratosphere through holes made during nuclear events. A vital usage is sighted in the

upgrading, by hydrogen fixation, of immoveable hydrocarbons and bitumens; and coal and organic matter liquefaction and conversion to fuels.

It is believed here that now a disclosure of the invention's main components, the way it is built, the way it operates, and the main applications and uses are made.

THE EMBODIMENT OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILAGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A wind driven twin turbines device for production of electric and mechanical energy, comprising:

the device's housing;

a pair of wind entrances;

a pair of wind compaction tunnels;

a pair of wind compaction tunnel exits;

a pair of wind driven turbine housings;

a pair of reduced size wind driven turbines;

a pair of wind driven turbine housing exhaust outlets;

means of coupling wind driven turbines to generators;

unique and standard generators; and

a means for the device's support and self-orientation.

2. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 1 wherein the device housing is an elongated rectangular structure with the long walls, each, many times longer than any of the short walls, or the height.

3. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 2 wherein the device housing long walls are self-orientable parallel to the wind direction.

4. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 2 wherein the device housings are stackable vertically and laterally, lengthwise, in an airtight fashion.

5. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 3 and 4 wherein the device housing upwind short side wall is replaced by two equal size wind entrances occupying the whole wall area side by side.

6. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 5 wherein the device housing's downwind short sidewall is penetrated by two or more air exhaust outlets.

7. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 4 wherein the device's housing is supported and self-oriented into the wind by means comprising:

a vertical pivot means, firmly imbedded in the ground below and positioned in the device's long axis, a short distance behind the up-wind short side, passing above the device's roof or any vertical stacking; and

pairs of free rolling devices firmly fitted, by means, to the device's housing underside to support it while itself supported on a solid flat platform.

8. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 1 and 5 wherein the device housing's pair of wind entrances is each individually connected, by means, in and airtight fashion, to one of two narrowing downwind, flatly smoothed inner-walled wind compaction tunnels.

9. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 8 wherein the two wind compaction tunnels extend horizontally, side by side, to near the device housing's downwind short wall.

10. A wind driven twin turbines device for production of electric and

mechanical energy, according to claim 8 or 9 wherein each of the wind compaction tunnels end up, downwind, in an exit many times smaller than the corresponding wind compaction tunnel wind entrance and is parallel to it.

11. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 10 wherein the wind compaction tunnel exits are slightly elevated one over the other.

12. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 11 wherein each of the wind compression tunnel exits is connected, in and air tight fashion, by means, to a congruent wind turbine housing positioned tangentially downwind with the long axis extension of the wind compaction tunnel passing through the axis of rotation of the wind turbine housing, perpendicularly.

13. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 12 wherein the wind turbine housing shape may be cylindrical or discoid; vertical-axle or horizontal-axle.

14. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 13 wherein the wind turbine housings may be positioned nearest or furthest from the devices housing long wall nearest to them.

15. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 6, 12, or 13 wherein each wind turbine housing is fitted with an exhaust outlet occupying an area on the circumference one quarter of the circumference times the height of the wind turbine housing, when it is vertically positioned; and is diagonally

downwind one quarter revolution from the wind turbine housing's entrance.

16. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 6 and 12 wherein each wind turbine housing exhaust outlet is connected, by means to, and penetrates the device housing's rear wall.

17. A wind driven twin turbines device for production of electric and mechanical energy, ccording to claim 13 wherein the wind turbine housings are each fitted, axially, with a freely spinning axle that surpasses the limits of the wind turbine housing, at both extremities, and end on one side in a coupling to a generator flywheel, and on the other in a ball bearing support means.

18. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 17 wherein each wind turbine axle within the wind turbine housing is fitted air tightly, by means, throughout its length, with four air expansion blades that are positioned between the turbine housing circumference wall and the axle, 90 degrees one behind the other, with the sides, free of the axle snuggishly touching the walls.

19. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 18 wherein the four air expansion blades freely rotate away from the wind with their concave faces towards it.

20. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 1 wherein at all times, the wind speed outside it is higher than in it.

21. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 5 wherein the removed upwind short side wall is relocated downwind to near the rear wall of the device's housing to form an inner wall of one large wind compression compartment in place of the two wind compaction tunnels.

22. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 21 wherein the inner short wall of the large wind compartment is fitted, in an airtight fashion, with turbine housing exhaust outlets that extend through the device's housing rear short side wall to the atmosphere.

23. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 1, 2, 3, 4,5, 6 or 17 wherein the device's housing is permanently and directly built on the ground with the removed short side wall side facing the prevailing wind, and the support and the self-orienting means absent.

24. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 1 or 6 wherein hydrogen and oxygen are electrolitically produced from sewage water, industrial waste water, rivers, lakes, and ocean, to do away with dumping and recycling.

25. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 1 or 6 wherein fresh water, free of carcinogens, harmful isotopes, and poisonous chemicals is produced.

26. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 1 or 21 wherein power pack recharging is made available at regular roadside intervals, for electric vehicles and other appliances.

27. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 1 or 21 wherein immovable hydrocarbons, bitumen, coal, and discarded organic matter are upgraded into fuels and other useful products through hydrogen fixation.

28. A wind driven twin turbines device for production of electric and mechanical energy, according to claim 1 or 21 wherein oxygen from water is restored to the troposphere and ozone to the ozone layer.

29. A wind driven twin turbines device for production of electric and mechanical energy, according to 1 or 6 wherein electric and mechanical energy is provided on ocean going ships.

OSSAMA 1. 1. YOUSIF
PATENT INVENTOR

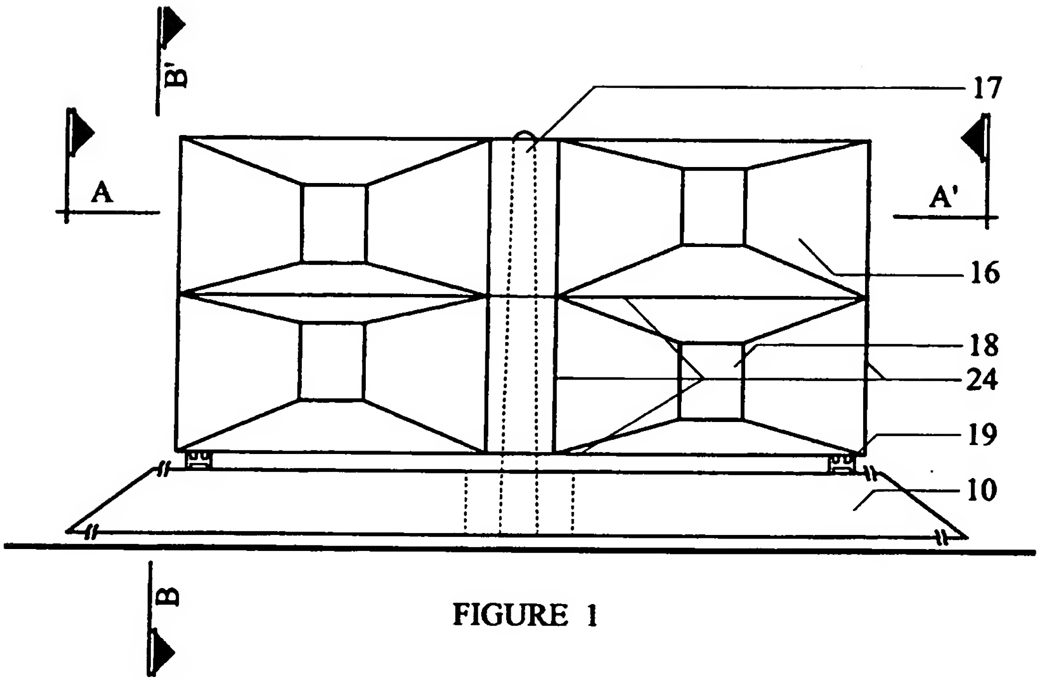



FIGURE 1

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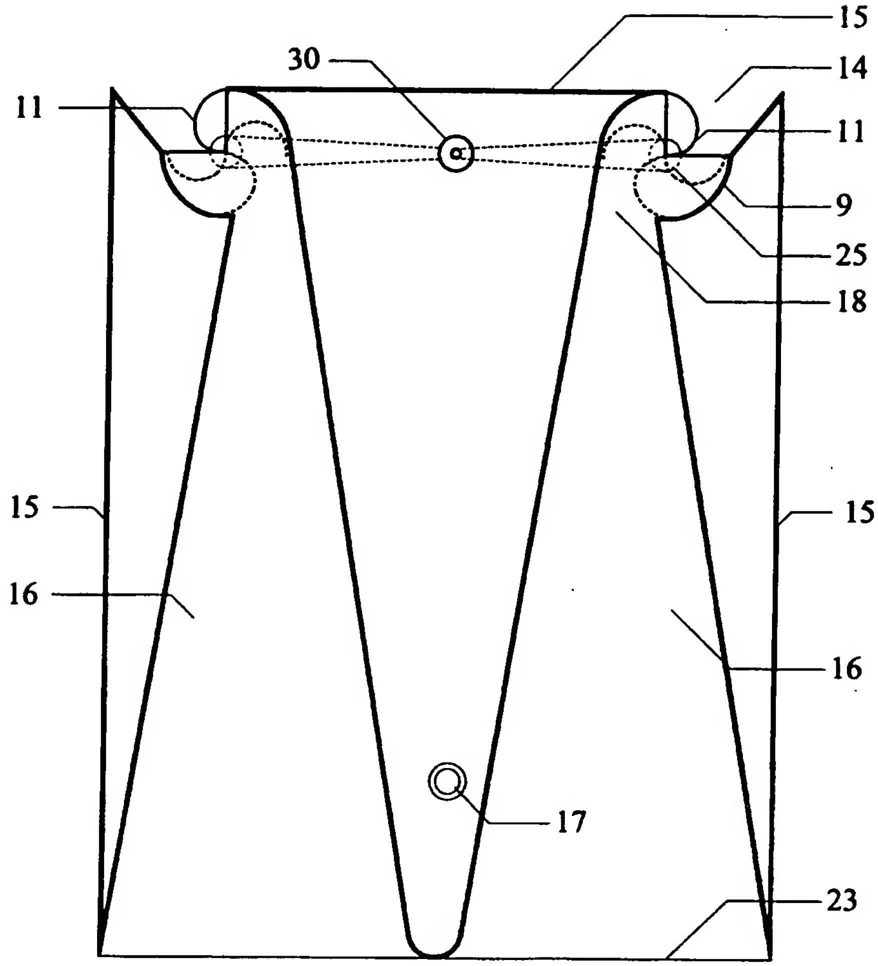


FIGURE 2



INVENTOR: Osso H.

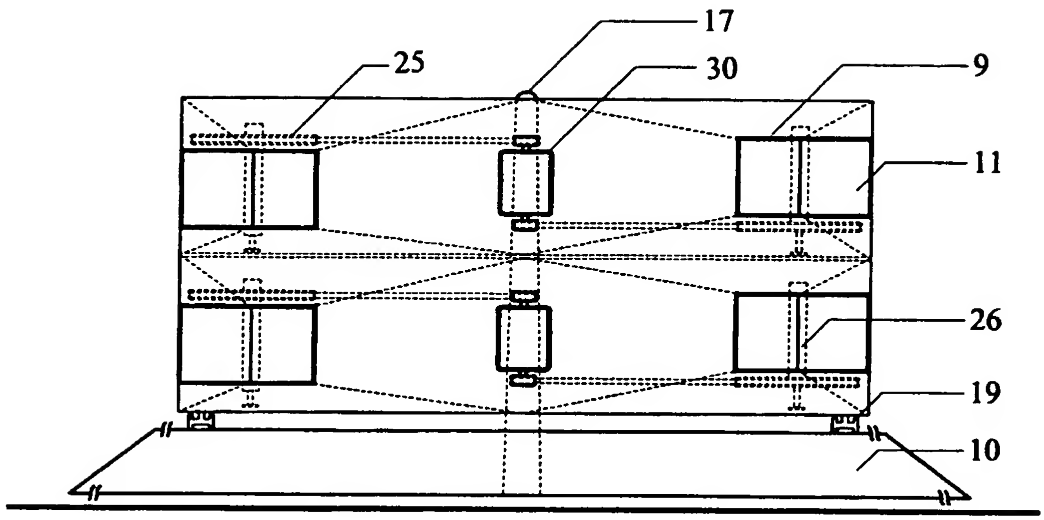


FIGURE 3



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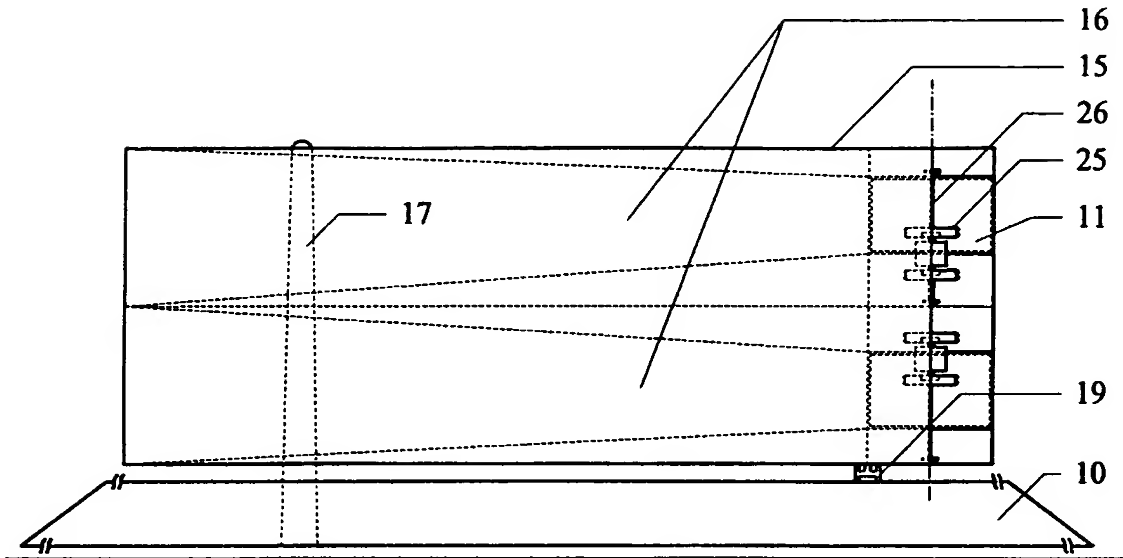


FIGURE 4



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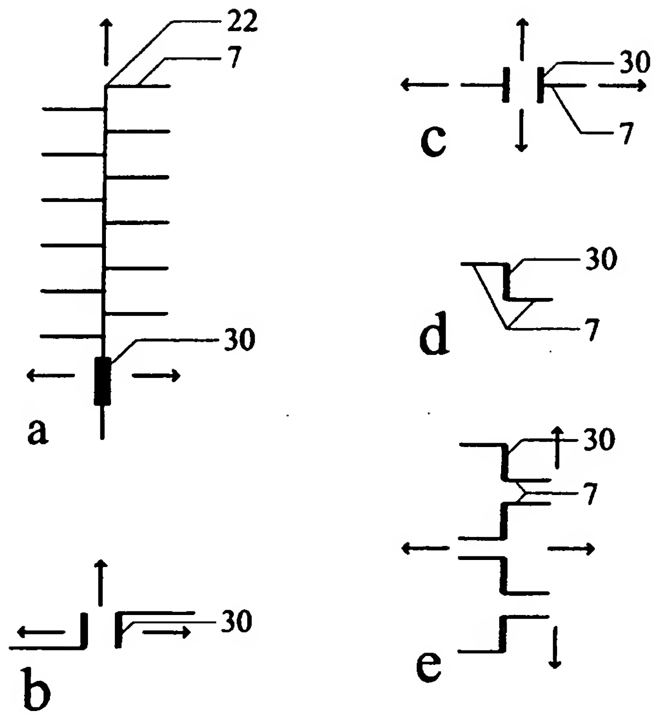


FIGURE 5



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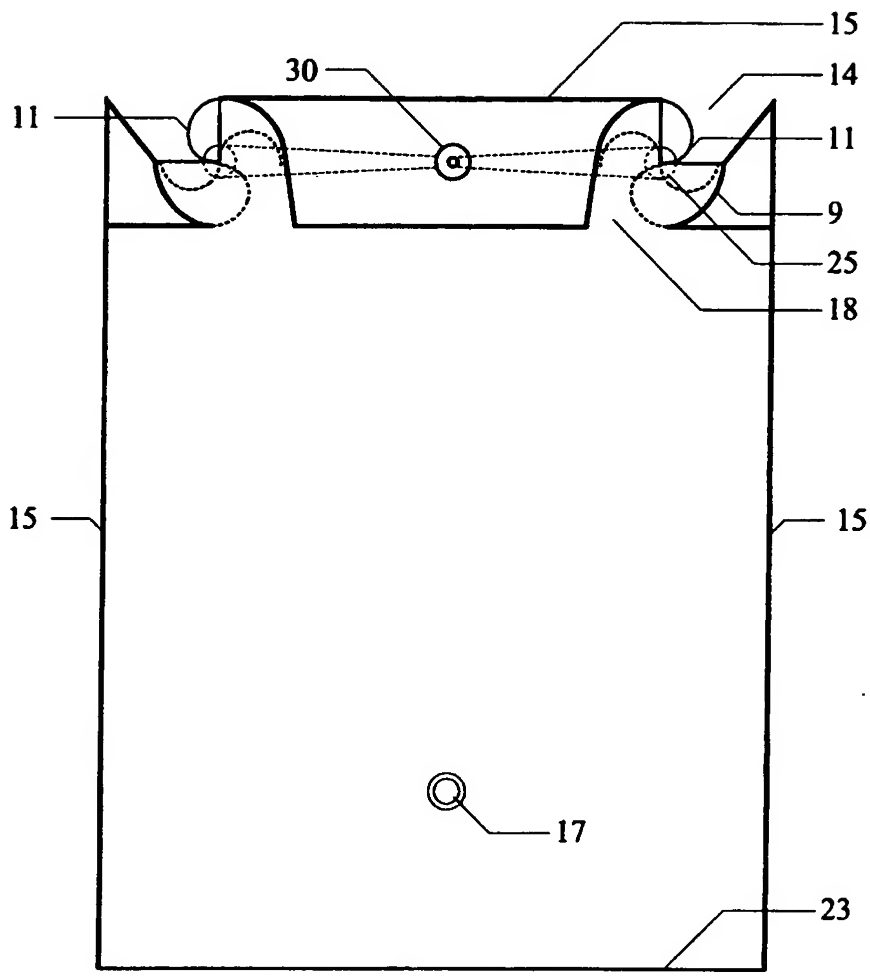


FIGURE 6



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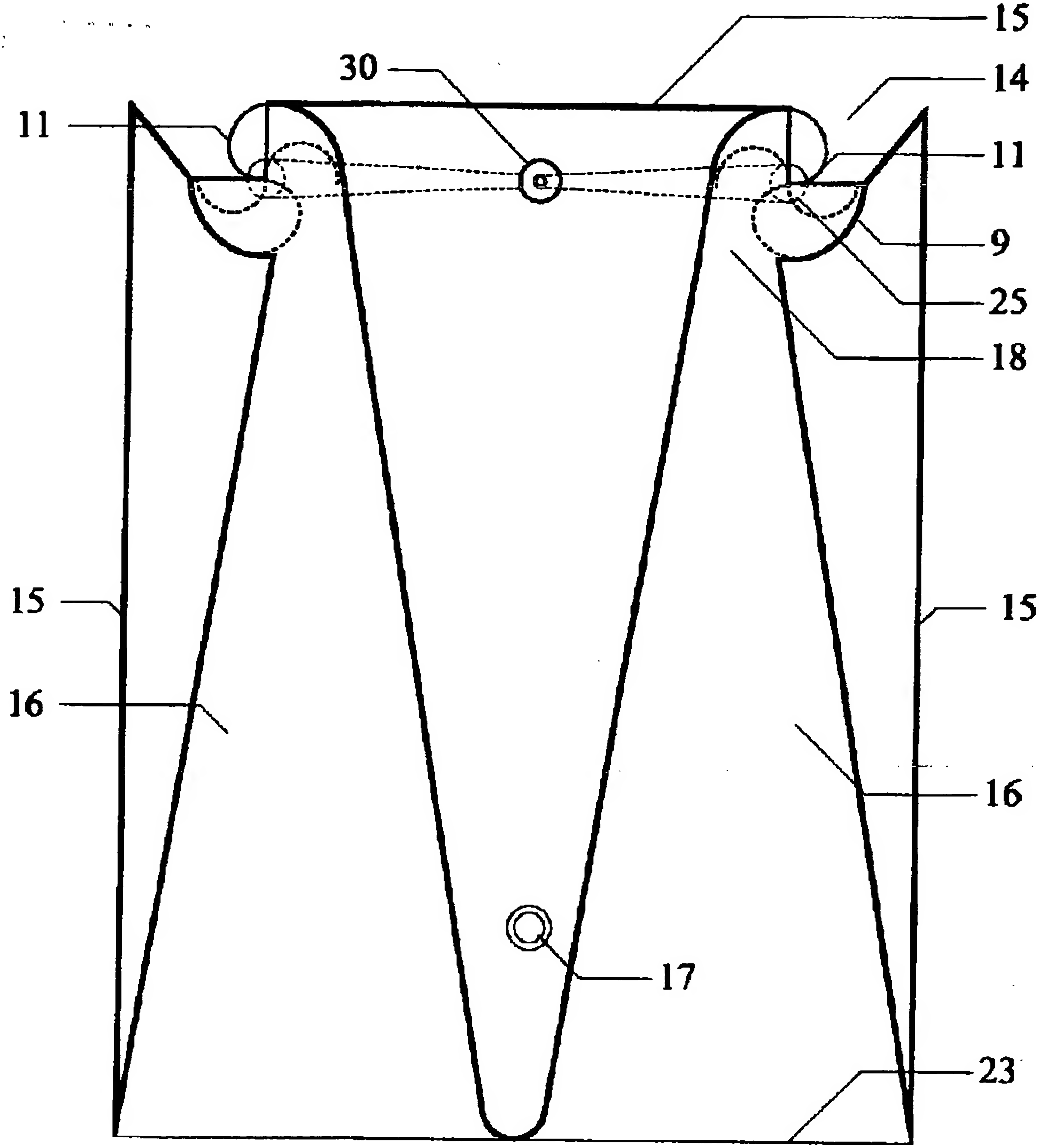
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